ATTACHMENT 2
Potential Stream Crossings for the Kittitas Valley Wind Power Project Memo

Potential Stream Crossings for the Kittitas Valley Wind Power Project

TO: Chris Taylor/Zilkha Renewable Energy

COPIES: Andy Linehan/CH2M HILL/Portland

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Introduction

This memorandum summarizes the results of a field survey performed to identify potentially jurisdictional waters and wetlands in the proposed Kittitas Valley Wind Power Project for Zilhka Renewable Energy. The project area lies entirely in Kittitas County, Washington. Improvements to existing roadways, new roadways, and underground cable installations may affect areas where there are potentially jurisdictional waters and wetlands.

The lead federal agency with jurisdiction over wetlands and jurisdictional waters for this project is the Army Corps of Engineers (COE). A Section 404 permit is required for projects with potential impacts to 'waters of the United States.' The section has a seven-part definition of these waters. Essentially, tributaries of navigable waters that provide for a broad range of interstate commerce uses, including intermittent streams, fall under the jurisdiction of the COE (33 CFR328.3 (A)(1-7). Intermittent and ephemeral streams are further defined as having flowing water during only part of the year (33 CFR Part 330; July 2002). The lead state agency is the Washington Department of Ecology (DOE). It complements the COE through the Section 401 Water Quality Certification program, but generally uses the COE definitions regarding stream and wetland resources. The field survey for this project examined ravines and drainages where waters meeting these definitions may be likely to occur.

Methods

A CH2M HILL biologist trained in wetland delineation and jurisdictional determinations, with work experience in the vegetation communities found in Kittitas County, performed the jurisdictional determination in April 2003.

Turbine strings, roads, and proposed developments were placed on a map with a United States Geodetic Survey (USGS) topographic background. Sites where developments intersected potential wetlands or streams were numbered for field study. Eight study areas with potentially jurisdictional waters or wetlands were identified (Figure 1).

Previous project studies examined Kittitas County soils survey information and reported no hydric soils in the project area. National Wetland Inventory (NWI) maps were also reviewed in previous work and no wetlands were identified in the direct project impact area. Two

wetlands shown on the United States Fish and Wildlife Service (USFWS) *Interactive Wetland Mapper* are located in the general vicinity of proposed project developments and were included in the study to confirm that they would not be affected by the project.

Plant resource studies for the project were reviewed for clues to habitat and vegetative composition (SCA Exhibit 8). No wetlands are mapped in the direct project impact area. The valley bottoms where potential streams occur are described in the Eagle Cap Consulting survey as being degraded from cattle grazing and road impacts and the resulting prevalence of non-native invader plant species.

Field Investigation

Field investigations took place April 11, 2003. Each study site was examined on foot and photographed. Significant features were recorded with a Trimble GeoExplorerCE GPS unit capable of one meter accuracy. An effort was made to locate any type of streambed, bank, or channel within or adjacent to areas of direct project impact, as identified on the USGS maps, the NWI maps, and aerial photography. Evidence of erosion, ponding, sedimentation, or scouring at each site was noted. Changes in vegetation composition, abundance, and distribution were evaluated.

An area is considered to be potentially jurisdictional if it has physical characteristics such as a streambed and discernable banks, and some evidence of appropriate hydrology. Vegetation is examined as a clue to subtle changes in moisture regimes. A change in species composition, distribution, or abundance in the study site is considered, along with the other factors, to make a best professional judgment about the status of the study site. The final determination of jurisdictional status is at the discretion of the regulatory agencies.

Results

The proposed wind turbine project will be located primarily along broad hill tops and ridges. Improved construction and maintenance roads and underground utility corridors that connect the turbines pass through low-lying areas and ravines in several locations. USGS-mapped intermittent streams in this arid region are often not found during field investigations, particularly higher up in the ravines where the potential drainage area is very small. Several of the study sites were of this type.

The weather ten days prior to the survey was seasonally cool and damp. The Cle Elum, Washington weather station 14 km northwest of the project area reported rain on all ten days, with a total precipitation of 0.99 inches. The average rainfall for the month of April at this station is 1.16 inches. In Ellensburg, 20 km to the southwest of the project, there were only two days of rainfall during the previous ten days with a total of .09 inches of rain. The average rainfall at this station for the month of April is 0.50 inches.

The following are results of the field survey at each study site.

- **A-1** is a nearly flat drainage basin located downslope of a man-made pond. An earthen berm has evidence of water seeping through a low swale and across Hayward Road to the southeast. A dirt road already crosses the area near the proposed access road. There is little water flow here, but there are wet holes up to 3 feet wide and 6 inches deep in places (Figures 2 and 3). The ground is damp in the lowest areas of the ravine and there

is some wetland vegetation. Some characteristics of wetland hydrology and vegetation are present. Although this site marginally meets the definition of wetland, and might be determined by the COE to be non-jurisdictional, for the purposes of evaluating all potential wetland areas, this area is assumed to meet the definition of jurisdictional waters. Impacts to jurisdictional waters could involve up to approximately 192 square feet.

The NWI maps identify a wetland nearby, which was found in the field to be a man-made pond located approximately 800 feet upslope to the northwest. There will be no project impacts to this NWI-mapped wetland.

- **I-1** is located on an existing road. The existing access road crosses an intermittent stream, but the proposed project road turns sharply to the right and goes up an existing road leading away from the stream to the southeast (Figures 4 and 5). This stream is presently approximately 6 inches deep and 6 feet wide and shows evidence of periodic flooding at higher levels. The substrate is coarse gravels and cobbles and there is little wetland vegetation. The stream is most likely jurisdictional, with well-defined banks, streambed, and evidence of hydrology. The proposed project road does not cross this jurisdictional stream. The closest point from the proposed road to the stream is 60 feet, measured from the apex of the bend in the road to the stream. There will therefore be no impacts to the intermittent stream in this area.

- **S-1** is near the location of the proposed project substation and in the vicinity of an NWI-mapped wetland (Figure 6). The wetland is a large stock pond with earthen impoundments (Figure 7). A culvert takes high water from Dry Creek to flood the pond. Stock use, and perhaps rapid seasonal drainage, restrict vegetation at the pond. The substation will be located upslope and to the west of the pond, approximately 700 feet distant, and there will be no project impacts to the wetland.

- **G-1** is a short open ravine ascending northwest from Highway 97 near a proposed access road to the "G" turbine string (Figure 8). It has a small drainage basin, but may collect groundwater from nearby sources. It is approximately 12 inches wide and was 1 inch deep the day of the survey (Figure 9). The culvert that drains the ravine below Highway 97 had a high-water stain of approximately 6 inches. Though very small in size and hydrology, it should be considered a potentially jurisdictional stream. The proposed access road in this area will be located upslope and to the south of the ravine by approximately 260 feet, and therefore any adverse impacts will be avoided.

- **H-1** is located near a proposed access road in the northern segment of the project. A nearby stream is approximately 6 feet wide and 18 inches deep (Figure 10). In early April it had 6 inches of flowing water. Some wetland vegetation is located near the stream, but the soils appear to be well-drained sands and gravels. The stream has well defined streambed and banks and is probably jurisdictional. The proposed road will be located approximately 580 feet upslope from the stream (Figures 11-12) and there will be no project impacts to this intermittent stream.

- **I-2** is located in the next valley to the east of H-1. A small intermittent stream is located in the bottom of a broad valley (Figures 13-14). The stream is approximately 2 feet wide and 6 inches deep (Figure 15). Water was flowing 3 inches deep during the survey. The

stream bottom is vegetated almost entirely with a dense growth of celery-leaved buttercup (*Ranunculus scelesatus*). This non-native annual herb frequently invades disturbed ground. In Region 9 it is an obligate (OBL) wetland plant species. This intermittent stream is probably jurisdictional for regulatory purposes. An underground collector cable and project road will cross this intermittent stream. Moving the crossing up or down the stream would not provide the opportunity to reduce impacts. The size of the stream and proposed utility corridor should limit impacts, however, to no more than 240 square feet.

- **J-1** is to the east of I-2 in the northeast segment of the project. The project road and underground cable route cross a small intermittent stream in the bottom of the ravine (Figure 16). The drainage is approximately 4 feet wide and 6 inches deep and had 2 inches of flowing water during the survey (Figure 17). Celery-leaved buttercup also stands in this water, but not a densely as at I-2. Trampling and use by stock have affected this area and there are a variety of noxious weeds adjacent to the stream. The stream has well defined banks and streambed and is probably jurisdictional. An existing jeep trail crosses the stream near the intersection of three ravines and the project road would cross in the same location. Other crossing locations would only serve to multiply impacts. Total square footage impacts at this location should be no more than 270 square feet. Given the geometry of the stream and the crossing, may not be practical to place the utility corridor exactly perpendicular to the course of the intermittent stream. The estimate of probable impacts takes this probability into account.

- **J-2** is located downslope of J-1 approximately ½ mile from that drainage. The intermittent stream in this area is approximately 6 feet wide and 12 inches deep and is vegetated with celery-leaved buttercup (No figure). The intermittent stream has the physical characteristics of a stream and is likely to be jurisdictional.

  The proposed project road and underground cable at this location are planned to pass between the intermittent stream and a nearby property corner. Impacts should be avoided. If this cannot be achieved after professional land surveys clarify the property boundaries at this location, the impacts should be no more than 300 square feet at this intermittent stream crossing.

Summary of Impacts

Table 1 summarizes the impacts to potentially jurisdictional waters and wetlands at the eight study sites. The calculations are based on a road corridor width of 24 feet and a combined utility and road corridor width of 30 feet. The exact impacts will be determined in the course of delineations to prepare the site figures for the JARPA. When project designs have been finalized and project developments have been surveyed and staked in the field, it will be possible to make the very accurate calculations of potential impacts required by the jurisdictional agencies.

TABLE 1
Summary of Impacts to Potential Jurisdictional Waters and Wetlands at Study Sites

Study Site[1]	Hydrology[2] (Y/N)	Vegetation[3] (Y/N)	Physical Characteristics[4] (Y/N)	Status[5] (Y/N)	Impacts (square feet)[6]
A-1	Y	Y	N	Y	192
I-1	Y	N	Y	Y	N/A
S-1	N	N	N	N	N/A
G-1	Y	N	Y	Y	N/A
H-1	Y	Y	Y	Y	N/A
I-2	Y	Y	Y	Y	240
J-1	Y	?	Y	Y	270
J-2	Y	Y	Y	Y	300
Total Area of Potential Impact to Jurisdictional Waters					1002

[1] All sites are located in U.S. Geological Survey quadrangles; Teanway, Swauk Prairie, Teneum Canyon, and Thorp, Washington.

[2] Evidence of sedimentation, ponding, erosion, scouring, or channeling.

[3] Evidence of changes in species, abundance, or distribution.

[4] Evidence of features such as definable streambed or banks.

[5] Jurisdictional status as a "waters of the U.S.," CFR 328.3; an expression of best professional judgment; determination to be made by agencies.

6 Square footage calculation assumes a road width of 20 feet.

NA = not applicable. Proposed project avoids study site resources.

Conclusion

Potential stream crossings and impacts were investigated at eight study sites for the Kittitas Valley Wind Power project. All the study sites had potentially jurisdictional waters or wetlands located nearby. At four of the locations, project design will keep project developments away from streams and wetlands and avoid any impacts to waters of the United States. In four other locations, potentially jurisdictional wetlands or intermittent streams were identified where impacts cannot be reasonably avoided.

COE issues Nationwide Permits (NWP) that authorize minimal project impacts to wetlands and waters. NWP 12 addresses Utility Line Activities and specifically addresses utility lines and access roads. NWP 14 addresses Linear Transportation Projects and crossings of waters of the state by roadways. Both permits provide acreage limits of not greater than ½ acre (21,779 square feet). The total anticipated impacts to the four study sites identified in the study with wetland resources or waters of the United States should be conservatively less than 1002 square feet. There are some differences in the requirements for these two different permits, and the COE will make the determination of which NWP to apply. The COE

agency contact for this project is Joe Brock in the Seattle COE Headquarters Office (206-764-6905).

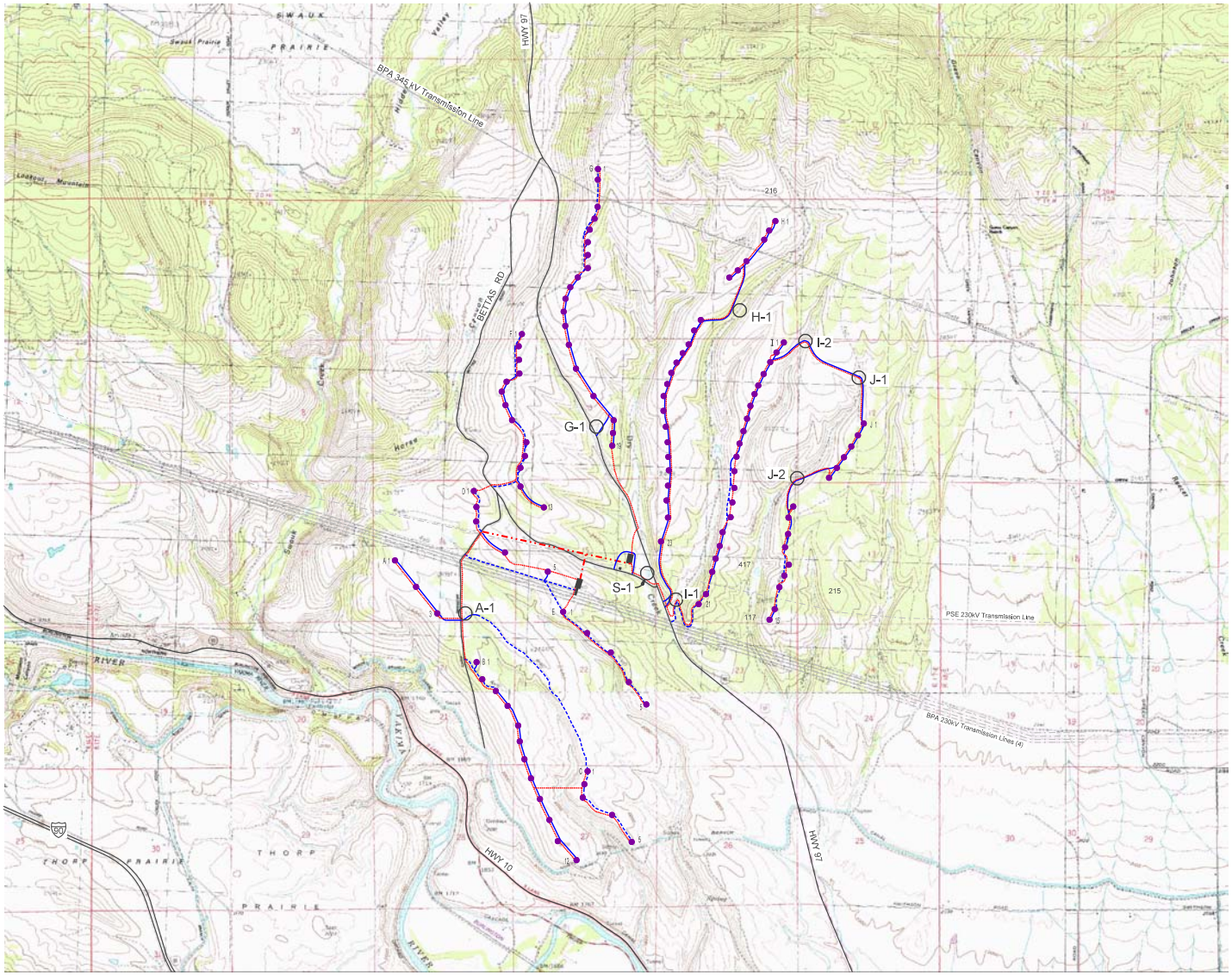
When construction specifications are nearly complete, a Joint Aquatic Resource Permit Application (JARPA) should be submitted to the COE. Additional copies should be forwarded to the DOE for Section 401 Water Quality Certification, the Washington Department of Fish and Wildlife (WDFW) for Hydraulic Project Approval (HPA), Washington Department of Natural Resources (WDNR) for conformation with threatened and endangered species regulations, and the Kittitas County Planning Department for conformity with Critical Areas Ordinances of the Growth Management Act.

The JARPA, in addition to delineations for impacts, will require very specific project detail drawings, and the COE should be consulted at that time for the latest specifications for these drawings. Additional federal permits should not be required, including the Section 10 Federal Harbor Act and the Federal Coastal Zone Management Act.

The DOE will provide Section 401-water quality certification to the COE before the NWP is approved. Depending on the total project impacts and which NWP the COE assigns, the DOE may require compensatory mitigation for the project. The agency contact to discuss project impacts, requirements, or mitigation strategies and proposals is Cathy Reed in the Yakima office of the DOE (505-575-2616). The DOE will check for compliance of the project with other state laws. The State's Shoreline Management Act should not apply to this project because none of the streams are identified as Shorelines in the County's Shoreline Master Program, and the mean annual flow in the project's intermittent streams falls below the 20 cubic feet per second (cfs) provided in the act. The Forest Practices Act will probably not apply to this project because no timber resources would be affected. The Washington Department of Natural Resources (WDNR) will need to confirm with DOE that there will be no project impacts to threatened or endangered species and their habitats. As part of its Hydraulic Project approval process the WDFW would normally visit the site, or rely on fisheries resource maps, to confirm that no impacts to fishery resources would occur.

The Kittitas County Planning Department has prepared a Critical Areas Ordinance pursuant to the state's Growth Management Act. The County will accept the JARPA application for the purposes of project review with local ordinances. The County has elected not to create a map or database of critical areas but instead compares project proposals with NWI maps and FEMA floodplain maps to insure compliance with resource protection regulations. The Planning Department contact for additional information about local permitting issues is Clay White or Dave Taylor (509-962-7506).

This wetland determination represents the best professional judgment of CH2M HILL; however, the U.S. Army Corps of Engineers and the Washington Department of Ecology will make the final jurisdictional determinations for regulatory permitting.



N

0 2000 4000 6000

Scale In Feet

LEGEND:

- J-1 STREAM SURVEY LOCATION
- PROPOSED WTG LOCATION
- N 1 STRING NAME & TURBINE COUNT
- EXISTING ACCESS ROAD
- NEW ACCESS ROAD
- UNDERGROUND ELECTRICAL
- OVERHEAD ELECTRICAL
- UGND AND/OR O.H. ELECTRICAL
- ▲ N12 MET TOWER - PERMANENT

Sagebrush Power Partners, LLC
Zilkha Renewable Energy

FIGURE 1
POTENTIAL STREAM
CROSSINGS SURVEY
APPLICATION FOR SITE CERTIFICATE
KITTITAS VALLEY WIND POWER PROJECT
APRIL 2003

CH2MHILL

170365.C1
FILENAME: zp-fig14-stream.dgn PLOT DATE: 18-APR-2003 PLOT TIME: 10:09:01

Site Photographs

Figure 2: Looking northwest up the swale at the dirt road crossing at A-1. Shooting stars (*Dodecatheon conjugens*) in open areas with small sage (*Artemisia tridentata*) on the fringes (NW).

Figure 3: Wet areas just east of A-1 crossing. Hummocky ground and variable sized pools of still water. Some frog's eggs seen in pools (SE).

Figure 4: Proposed project road turns away from intermittent stream and heads upslope to the southeast. High water scour-line evident in streambank (SE).

Figure 5: View looking down project road at I-2. Entry road turns sharply left and avoids impacts to intermittent stream. Outside of turn approximately 60 feet to stream (NW).

Figure 6: Proposed substation is located to the right and behind triple wood power poles approximately 700 feet upslope and west of wetland stock pond at Hwy. 97 and S-1 (NW).

Figure 7: Earth berm impounds water at wetland located near substation. Water is derived from high water culvert leading from Dry Creek to pond. No impacts anticipated here (S).

Figure 8: Open ravine in G-1 area. New access road will lead in to the right of the drainage just out of view along the top of the slope (NE).

Figure 9: Top-end of G-1 ravine where marginal intermittent stream stops. Lower down stream is approximately 1 foot wide and 2 inches deep. Some banks and scouring (SW).

Figure 10: View of the intermittent stream at H-1 with obvious banks and streambed. Cattle, roads and well-drained soils may limit wetland vegetation adjacent to stream (N).

Figure 11: SE Sambrano property monument shows just to the right of vehicle at top of slope. It is approximately 580 feet from H-1 intermittent stream to property boundary (W)

Figure 12: General view above I-2 intermittent stream. Vegetation along the drainage is nearly entirely celery-leaved buttercup. Effects of cattle grazing evident (NE).

Figure 13: 1/4-mile downslope from I-2.. Vegetation all celery-leaved buttercup. Some areas with groundwater springs. Stream flow about 3 feet wide and 2 inches deep (NE).

Figure 14: Project crossing at I-2 intermittent stream. Less water and vegetation than downstream areas shown in Figure 13. Channel approximately 24 inches wide and 5 inches deep. Water in this photo is 3 inches deep. Good view of mono-culture of buttercup typical of the drainage (N).

Figure 15: Overview of the crossing at J-1. Proposed road enters from left and crosses near center of picture. Other locations up and down stream impractical (NE).

Figure 16: Close view of intermittent stream at J-1. Less buttercup and water than at I-2. Water 2 inches deep. Channel approximately 4 feet wide by 6 inches deep (S).